

Application No. 10/673767
Page 8

Amendment
Attorney Docket No. 011.2B-11336-US01

Amendments To The Drawings:

None.

Application No. 10/673767
Page 9

Amendment
Attorney Docket No. 011.2B-11336-US01

Remarks

This Amendment is in response to the Office Action dated September 21, 2004.

A full three month extension of time is required by this response.

§112 Rejections

Regarding the 112 rejections, claims 1, 12 and 18-20 have been amended to overcome the rejections. The amendment is supported by the specification, page 4, lines 12 to 30.

§103 Objections

As disclosed in a paragraph from line 21 on page 8 to line 13 on page 9 of the original specification, when the polishing composition contains a great amount of silicon dioxide in small size, a great amount of abrasives is likely to remain on the wafer surface after edge polishing. The inventor of the present invention found out that controlling the average primary particle diameter D_{SA} of silicon dioxide, and one of the ratio D_{95}/D_5 and the value $D_{95}/D_5/D_{SA}$ related to the particle diameter of silicon dioxide permits the amount of small size silicon dioxide in the polishing composition to be favorably controlled, and that the number of abrasive remaining on the wafer surface after edge polishing is favorably controlled, accordingly. However, as obvious from a section of the specification that explains the Examples and the Comparative Examples, the advantage cannot be obtained only by controlling the ratio D_{95}/D_5 or the value $D_{95}/D_5/D_{SA}$, or by controlling the average primary particle diameter D_{SA} . The present invention was made based on such findings.

In contrast, the references cited by the examiner do not disclose or teach that it is important to control the average primary particle diameter D_{SA} and one of the ratio D_{95}/D_5 and the value $D_{95}/D_5/D_{SA}$ for reducing the abrasives remaining on the wafer surface after edge polishing. Therefore, we believe that even if the cited references are combined, the present invention cannot be conceived.

As clearly shown in claim 1, the polishing compositions according to claims 1 to 11 have the following characteristics: (1) the average primary particle diameter D_{SA} of the silicon dioxide in the polishing composition is at least 40 nm; and (2) the ratio D_{95}/D_5 of the silicon

Application No. 10/673767
Page 10

Amendment
Attorney Docket No. 011.2B-11336-US01

dioxide, which is obtained by dividing the 95th percentile diameter D_{95} by the 5th percentile diameter D_5 , is no more than 3.8. Since the polishing compositions according to claims 1 to 11 have these two characteristics, the compositions are superior to conventional ones. Specifically, the polishing compositions of Examples 1 to 35 have the above characteristics and thus have an excellent property in reducing stains on the water surface after edge polishing (refer to table 1). In contrast, the polishing compositions of Comparative Examples 1 to 20, which lack at least one of the above characteristics, do not have such a property (refer to table 2).

As clearly shown in claim 12, the polishing compositions according to claims 12 to 17 have the following characteristics: (1) the average primary particle diameter D_{SA} is at least 40 nm; and (2) the value $D_{95}/D_5/D_{SA}$, which is obtained by dividing the ratio D_{95}/D_5 by the average primary particle diameter D_{SA} , is no more than 0.07. Since the polishing compositions according to claims 12 to 17 have these two characteristics, the compositions are superior to conventional ones. Specifically, the polishing compositions of Examples 1 to 35 have the above characteristics and thus have an excellent property in reducing stains on the wafer surface after edge polishing (refer to table 1). In contrast, the polishing compositions of Comparative Examples 1 to 20, which lack at least one of the above characteristics, do not have such a property (refer to table 2).

As clearly shown in claim 18, the polishing composition used in the method according to claim 18 has the following characteristics: (1) the average primary particle diameter D_{SA} is at least 40 nm; and (2) the ratio D_{95}/D_5 is no more than 3.8. Since the method according to claim 18 has these two characteristics, the method is superior to conventional ones. Specifically, the methods of Examples 1 to 35 have the above characteristics and thus have an excellent property in reducing stains on the wafer surface after edge polishing (refer to table 1). In contrast, the methods of Comparative Examples 1 to 20, which lack at least one of the above characteristics, do not have such a property (refer to table 2).

As clearly shown in claim 19, the polishing composition used in the method according to claim 19 has the following characteristics: (1) the average primary particle diameter D_{SA} is at least 40 nm; and (2) the value $D_{95}/D_5/D_{SA}$ is no more than 0.07. Since the method according to claim 19 has these two characteristics, the method is superior to conventional ones.

Application No. 10/673767
Page 11

Amendment
Attorney Docket No. 011.2B-11336-US01

Specifically, the methods of Examples 1 to 35 have the above characteristics and thus have an excellent property in reducing stains on the wafer surface after edge polishing (refer to table 1). In contrast, the methods of Comparative Examples 1 to 20, which lack at least one of the above characteristics, do not have such a property (refer to table 2).

As clearly shown in claim 20, the polishing composition used in the method according to claim 20 has the following characteristics: (1) the average primary particle diameter D_{SA} is at least 40 nm; (2) the ratio D_{95}/D_5 is no more than 3.8, and (3) the value $D_{95}/D_5/D_{SA}$ is no more than 0.07. Since the method according to claim 20 has these three characteristics, the method is superior to conventional ones. Specifically, the methods of Examples 1 to 35 have the above characteristics and thus have an excellent property in reducing stains on the wafer surface after edge polishing (refer to table 1). In contrast, the methods of comparative Examples 1 to 20, which lack at least one of the above characteristics, do not have such a property (refer to table 2).

Conclusion

In view of the foregoing it is believed that the present application, with claims 1-20 is in condition for allowance. Early action to that effect is earnestly solicited.

Respectfully submitted,

VIDAS, ARRETT & STEINKRAUS

Date: March 21, 2005

By: _____

Scott Q. Vidas

Registration No.: 30812

6109 Blue Circle Drive, Suite 2000
Minnetonka, MN 55343-9185
Telephone: (952) 563-3000
Facsimile: (952) 563-3001

f:\wpwork\sqv\11336us01_and_20050321.doc

BEST AVAILABLE COPY